OBSERVATIONS

ON

THE TREATMENT

OF

FRACTURES OF THE FEMUR

WITH A NEW APPARATUS

AND

REPORT OF SEVENTEEN CASES.

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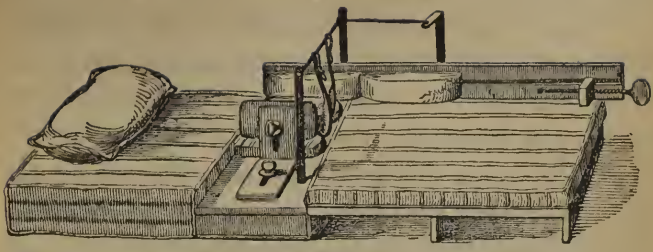
DEDICATION.

TO OUR VENERABLE GRANDFATHER, WM. G. SHAW, M. D.,

Of Wickford, Rhode Island,

WHO HAS BEEN IN ACTIVE PRACTICE AS A MEMBER OF OUR ARDUOUS PROFESSION FOR MORE THAN SIXTY-SEVEN YEARS, THIS LITTLE WORK IS DEDICATED, AS A TRIBUTE OF GRATITUDE FOR HIS WISE COUNSELS, AND FOR HAVING EARLY INSPIRED US, BOTH BY PRECEPT AND EXAMPLE, WITH AN EARNEST DESIRE TO DO SOMETHING FOR SUFFERING HUMANITY.



Burge's Apparatus for Fractured Thigh.

During the first years of our professional life, our attention was specially called to the subject of surgical appliances, by grave cases occurring in our own practice. It seemed to us a serious evil, which nothing but necessity could justify, to confine a patient for months to an absolutely supine position with bands about the chest and painful pressure upon so sensitive a part as the groin, and yet such were essential parts of the very *best* treatment yet devised for Fracture of the Thigh. We shall not attempt to conduct the reader through the tedious detail of three years' experiments but will ask his attention to the results obtained. In a paper read March 11th, 1857, before the Brooklyn Med. Chirurg. Society, and published in the May number of the *New York Journal of Medicine* for the same year, we made the following observations upon exten-

sion and counter-extension, which we transcribe as an appropriate introduction of our subject to the Profession at large:

"It is not necessary that I should review the means hitherto adopted for fulfilling the simple indications of *reduction* and *retention*. They are sufficiently well known, and, I may say of nearly all of them, the objections to them are sufficiently obvious. The first great advance in this department was made by DESAULT, when he introduced the long straight splint extending from the crest of the ilium to beyond the foot. Indeed, so great was this improvement over every previous method, that, notwithstanding the important modifications which it has undergone at the hands of our own PHYSICK and others, DESAULT's name is never omitted in this connection. During the last half century, numerous contrivances have been proposed for the treatment of fractured thigh; and, though some of them possess real merit, I believe the surgical world would not hesitate to declare that DESAULT's splint, with PHYSICK's modification and the screw first introduced by BOYER, and since perfected by others, is worth more than all other means ever employed.

"And yet, my object in the present paper is to refer to its acknowledged defects, and to propose a plan by which, in my humble opinion, they may be obviated.

"It is not my purpose to reply to what has been called 'the persuasive eloquence of POTT,' in his arguments for relaxing all the muscles of the thigh—nor

to criticise the practice of any individual surgeon who has labored to furnish us with more reliable appliances for the treatment of the accidents under consideration; I appreciate all their efforts, and have no desire to detract from the honor which is justly due them.

"The double inclined plane of Sir CHARLES BELL, with its various modifications by LISTON, LONSDALE, AMESBURY, SPAULDING, JARVIS, NATHAN R. SMITH, and others, is an excellent resource in cases where there is some special contra-indication to the straight position. But as I write now only for those who are familiar with the annoyances, and the results, of all methods of treatment yet in use, and as preference is generally given to the straight position, I shall deal with that alone in the rest of this paper.

"The objections to the present form of the straight apparatus are—

"1. That the counter-extending pressure falls heavily upon the groin, (a most sensitive part), causing much pain to the patient, and, also, anxiety to the surgeon, on account of the liability to excoriation and sloughing, and the consequent necessity of moving the perineal strap to the other groin, and perhaps, of removing it altogether, in which case the prospect of a shortened limb is by no means an agreeable one to any of the parties concerned.

"2. The strap around the waist, which, though it be not tight enough to impede respiration, is a great restraint, and, to one of nervous temperament, almost

insupportable. The patient must swallow both food and drink while in an absolutely supine position, and can perform no voluntary motion of the trunk whatever. Indeed, in a fracture of both thighs, this confinement becomes a truly serious evil.

"3. That the hips of the patient sink in the bed, and are very liable to move away from the splint, and thus throw the limb out of the proper line.

"During the last year, my brother and I have devoted considerable time and thought to the development of an apparatus which should not only be liable to none of these objections, but present also certain new features of great practical utility. After describing it and pointing out the advantages which we hope to gain, we shall leave it to the profession to decide how well we have succeeded in our effort. Our observations and experiments have led us to the following conclusions:—

"1. That the straight position is preferable in a large majority of cases.

"2. That it is entirely unnecessary to confine any part of the body except the fractured limb, and that to which it is immediately articulated, viz., the pelvis.

"3 That the pelvis should be so secured as not to be liable to lateral motion, or to sink in bed.

"4. That the groin is not a suitable part for the counter-extending pressure to fall upon.

"5. That the tuberosities of the ischia are proper points for such pressure

"6. That such provision should be made for facility of defecation as will obviate the necessity of disturbing the patient at each alvine evacution.

"The correctness of these principles seems to us too obvious to require argument. We shall, therefore, spend no words upon them, unless they are called in question, but proceed at once to speak of our method of reducing them to practice.

"First, then, in general terms, we retain the straight splint of DESAULT at its original length—that is, from the crest of the ilium to several inches beyond the foot—and make the extension in the usual way, by means of the screw, adhesive plaster,* and roller. We discard the hitherto excellent modification of PHYSICK, not only because they confine the chest, and prevent that freedom of motion of the upper part of the body which is so essential to the comfort of the patient, but because we obviate the necessity of such confinement by securing the pelvis, as already intimated, against all lateral motion, and also against the possibility of sinking in the bed. In order to prevent the pressure in the groin, we attach the counter-extending pads and straps by one end to a cushioned platform, upon which the hips of the patient lie, and by the other to a transverse horizontal rod, above and

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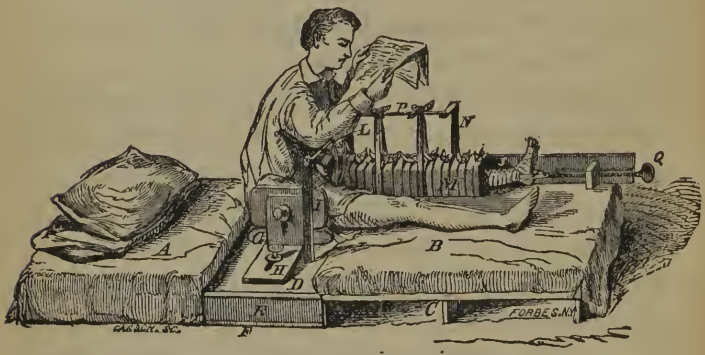
* The present form of the screw was devised by T. HEWSON BACHE, M. D., of Philadelphia, while a resident physician in the Pennsylvania Hospital; and the use of the adhesive strap is generally ascribed to JOSIAH CROSBY, M. D., of Manchester, N. H.

in front of his body, while we fix the upper end of the long splint at a point opposite the side of the pelvis, and independently of all direct connection with the counter-extending pads or straps." To be a little more explicit, our apparatus (see engraving,) consists



of **A**—a thick mattress covered by a sheet and supporting the pillows. **B**—A thin mattress forming the lower half of the bed. **C**—A wooden platform upon which this mattress is laid. This platform is made in two pieces and hinged together so as to fold upon itself for convenience of transportation, and when in use is hooked upon the central platform **D**. **D**—Central or cushioned platform, supported at either end by wooden strips **E**, which rests upon a second platform of same extent as **D**, and constituting a shelf for the bed-pan, which may be introduced below from either side. **G**, is a firm but easy hair cushion, upon which the hips of the patient

rest. This cushion, as well as the platform **D** to which it is fastened, has a semi-circular opening at its lower margin for convenience of defecation. **H**—A rectangular wooden slide, (we now use iron,) corresponding to its fellow upon the opposite side of the pelvis. These slides are so arranged upon the platform **D** as to be separated or approximated at will, and by a thumb-screw which passes through a fissure in the horizontal portion of each, they may be fixed at the desired point, so as exactly to embrace the pelvis of any patient. There is also a fissure in the perpendicular portion of each slide, and a screw passing through the same—one of these is to secure the upper end of the long splint **J**, and the other for the attachment of the short splint **I** upon the side of the pelvis corresponding with the uninjured limb. Both of these splints are well padded upon one surface, and may be elevated or depressed at will in order to bring them to the level of the limb, and fixed at the proper altitude by the screws already mentioned. They are also mutually transferable, thus adapting the apparatus to fractures of either thigh.

S S are counter-extending pads. These are attached by leather straps to the upper surface of the platform **D** about twelve inches apart. Passing under the cushion **G** and becoming well rounded pads, they traverse the tubcrosities of the ischia, pass between the thighs and thence perpendicularly to the horizontal iron rod or cross-bar **L**. The cross-bar **L** is supported at either

end by a perpendicular bar, extending upward from the platform **D.** Attached by one extremity to the cross-bar **L** is a rod **P,** running parallel with and situated directly above the thigh. The other end of this rod is supported by the arched iron rod **N** extending upward from the outer side of the long splint **J.** This is designed to afford special support to the injured limb whenever such support is deemed advisable, and is we think in many cases, of essential service in preserving the arched form of the femur. Two or three strips of cotton cloth, of suitable width, may be passed around the limb, either internally or externally, to the splints of coaptation as occasion may require, and tied over the supporting rod **P.** Splints of coaptation are to be applied according to the exigencies of the case and the views of the surgeon in attendance.

Q, the screw by which extension is effected in the ordinary way. It has at one extremity a swivel, and a hook tied to a strip of wood in the loop of adhesive plaster below the foot. The ends of the strip of plaster extend upon either side of the limb to near the point of fractum, being kept in place by a roller bandage evenly and rather firmly applied from the toes.

M is an inside splint covered by the bandages. The dressings, in one respect, not being well represented in the engraving, we refer the reader to the *directions,* (page sixteen,) for the proper mode of securing the splints of coaptation.

So simple is this apparatus in its construction, that no surgeon can fail in its application, and we should certainly apologise for giving such specific directions as are found in these pages, if this pamphlet were not designed as well for the instruction and guidance of the tyro, as for the purpose of calling the attention of the veteran surgeon to our humble effort. During the past year our apparatus has been seen by nearly all the surgeons of New York and Brooklyn, and a large number of the more noted have observed its application or used it in their own practice. It is also in use in various parts of the Union, and it is with satisfaction that we record the fact that all comments thereupon have been of a favorable character. We believe we speak the sentiments of all who have seen it in use, when we say that it will enable us—1. To get firm osseous union in many cases where otherwise it would be unattainable. 2. To report a very much larger percentage of perfect results than the history of these cases has hitherto exhibited. 3. To save limbs, and in some cases even lives, which must otherwise be sacrificed. 4. To make patients more comfortable than under any previous method of treatment; and 5. To prevent a great deal of unnecessary trouble to nurses and attendants, and to secure a degree of cleanliness which otherwise it were vain to expect. Although our apparatus was expressly designed to answer the indications of extension and counter-extension in cases of fractured thigh, we find it invaluable

in a large class of cases in which no extension is required. For instance, whenever it is desirable to furnish a patient (no matter what his ailment) with a firm and easy bed upon which he shall be able to lie quietly without danger of slipping from side to side or of sinking into deep hollows; in other words, when you would keep one or both of the lower extremities quiet and at the same time provide for perfect freedom of the upper part of the body, and guard against the necessity of disturbing your patient whenever he requires an alvine evacuation. It is a capital resource in cases of incipient hip disease—affording us an opportunity of making, in a painless manner, just extension enough of the limb to take off the pressure from the inflamed surfaces, and also to fulfil the important indication of rest to the joint, while the apparatus can easily be so arranged as to enable the surgeon to apply counter-irritants at pleasure.

It has also been used advantageously for fractures of the ossa innominata, and was highly recommended in the treatment of these cases by other surgeons long before we made any allusion to the subject.

If we had a patient with extensive burn of one lower extremity, and more especially if both were involved, we should certainly place him on this apparatus, minus the long splint. If diarrhœa exist, the advantage of this method is incalculable. It is unnecessary to particularize farther. Every practical surgeon possessing the apparatus will readily see the many uses to which he may put it

The following theoretical objection having been suggested personally to us, we will reply to it in this place. It is, that by the firmness of the central cushion, sores might be caused over the sacrum, to which we answer that we and others have already treated cases ranging from eight to seventy-six years of age, and no such difficulty has ever threatened—nor is this surprising when we recollect that the pelvis, though fully secured against all injurious motion or displacement, is not however so confined as to prevent the patient from relieving any irksome position. The side splints make no pressure against the hips, but are merely in apposition thereto and firmly fixed. He does not feel that he is much confined. He can lie perfectly flat, or can allow his shoulders to fall below the level of his hips, (thus at the same time lessening the pressure of the perineal straps and slightly elongating the limb,) or he can have his pillows high, or still farther, he can sit erect—*a happiness never before granted to a patient with fracture of the thigh unless all hope of ossific union were given up* It is therefore easy to see why no injurious or painful pressure comes upon any point; and while all this liberty is allowed to the patient, we can affirm, not only that the union of the bone is not prevented or retarded, but that it is in a great degree promoted, inasmuch as, *caeteris paribus*, every thing which conduces to health and comfort must have this tendency.

There is not, and cannot be, any apparatus which will obviate the necessity of watchfulness and skill on

the part of the attending surgeon. It is utterly impossible to express by words, written or spoken, just how tight bandages should be applied, how easily or how forcibly the limb should be extended, how often dressings should be readjusted, in what cases it is best to use a posterior splint and in what to omit it. These and a thousand other points are necessarily left to the judgment and skill of the attending surgeon, and upon them depend his responsibility, his honor and the welfare of his patient.

Among the many lesser points of advantage growing out of those mentioned, we deem it worthy of particular notice, that in our apparatus the free circulation in the limb is not interfered with by the counter-extending straps, as it must be to some extent when this strap nearly encircles the thigh as in Physick's Desault. Consequently, permanent dressings can be applied and extension commenced much earlier, to the great comfort of the patient, since by this means we effectually prevent those painful twitchings of the muscles which are so common during the first few days, while we run no risk of increasing or continuing the swelling which results from the local inflammatory action.

Again it will be observed, that when the dressings are properly applied, they retain their place so perfectly as to make it unnecessary to re-dress the limb so frequently as is generally required when the common straight splint is used.

We invite the special attention of naval surgeons, and others interested in a sea-faring life, to the great advantages of our apparatus on shipboard. A simple platform six feet long and two feet wide, slung with ropes at the corners, suffices for its support. It should of course be well secured; and then, amid all the rolling and lurching of the ship, the patient will rock and rest like a child in his cradle. Our observations upon this point are not entirely theoretical—one of us having spent at least one year in the capacity of ship surgeon, (though not in the navy) we know something, at least, of the difficulties to be overcome. Many of the worst cases of deformity after fracture, are the result of accidents occurring at sea, and are due as often to the impossibility of retaining the fragments in apposition, during a gale, as to the absence of surgical attendance.

In large works upon surgery, directions sufficiently minute for the guidance of the young surgeon in taking care of a fractured femur, are seldom given. We have therefore thought to do good service, especially to those who have not had the advantage of hospital experience, by making the following as comprehensive as possible. It will be observed by the reader, that a majority of these directions are quite as necessary to be observed when the ordinary straight splint is used, as with our apparatus

DIRECTIONS.

A firm, unyielding, level surface, should be provided, on which to place the apparatus. It may be an iron bedstead or an ordinary bedstead, (without footboard,) the surface being made level by boards laid across; or it may be a simple platform, little more than six feet long and two and a half wide, firmly supported at the hight of two or two and a half feet from the floor.

1.—Hook the pad-straps upon the screws provided for that purpose on the upper surface of the platform **D.** Unless the patient be a small child, the two screws farthest apart should be selected.

2.—Tie upon the platform **D** the cushion **G,** with the semi-circular opening of each, corresponding to that of the other, and the counter-extending pads emerging at the opening.

3.—Fix the now cushioned platform **D** upon **F,** and place the whole upon the center of the bedstead or other surface already prepared, with the semi-circular opening in the cushion towards that part designed for the foot of the bed.

4.—Hook the wooden platform **C** upon **D** and place upon **C** the thinner mattress.

5.—Use the thick mattress to form the head of the bed, placing beneath it other bedding sufficient to raise it at least to the level of the cushion **G.**

6.—The mattresses being neatly covered with separate sheets, and pillows provided for the head, the patient may now be carefully placed so that his hips shall rest upon the central cushion, and the anus point to the semi-circular opening.

7.—If the fracture be compound, the mattress and the splints should be protected by oiled silk or rubber cloth—the limb should be bandaged and roller applied as in simple fracture, except that neither the roller nor adhesive plaster should extend as high as the lower margin of the external wound, and from the point where they cease a many-tailed bandage may be applied with such local treatment as the case may require. If the wound be on the anterior or internal aspect of the limb, the long splint may be applied exactly as in simple fracture; but if there be a considerable wound upon the outer side, a piece of the long splint should be sawed out and the remaining parts reconnected by a simple arch of iron thus,

which may be made by any blacksmith in an hour, and this will leave the parts perfectly accessible. Always, when practicable, a compound fracture should be converted into a simple one, by promoting in every possible way the healing of the external wound.

8.—If the fracture be simple, the roller and adhesive plaster should be applied as follows: measure the limb from the point of fracture to the sole of the

foot—double this measurement and then add six inches, and this will give you the proper length for the adhesive strips. We generally use two thicknesses, causing them to adhere firmly to each other before we apply them to the limb. This may most conveniently be done by moistening the surface of one strip with spirits of turpentine and applying the other thereto; or by first laying one evenly upon the other, and then drawing them slowly around a tin-kettle filled with hot water. These strips should be about two inches wide. At the middle of the double strip, *i. e.*, at the part which is to form the loop below the foot, it should be strengthened, and its adhesive surface covered by a third strip about fourteen inches long and three and a half wide, applied face to face and folded over the edges. This will prevent the plaster from adhering to the bandage about the ankle, and thus remove one obstacle which sometimes stands in the way of an accurate measurement of the limb while under treatment. Having prepared the plaster, take a roller about two and a half inches wide and apply it to the foot—on reaching the ankle, apply the plaster so as to leave the loop below the foot of convenient length, and then continue the roller outside the plaster to near the groin. It is very important to apply the plaster as nearly as possible at the same level on the outer and inner sides of the limb—otherwise,

when extension is made, it will tend to rotate the same, and cause eversion or inversion. Proper attention to this point is better than any foot piece. When a tendency to eversion or inversion already exists, we find no difficulty in overcoming it by a careful placing of the limb, before the splints of coaptation are firmly secured; and perhaps in some extreme cases, by a simple loop of bandage over the foot, fastened, as occasion requires, to some fixed point at the right or left.

9.—Having completed the application of the roller, introduce the two perpendicular iron bars into the mortises provided for them in the platform **D**, then slip the ring at the end of the supporting rod **P** upon the cross-bar **L**, and adjust the latter as seen in the engraving.

10.—Buckle the counter-extending pads **S S** around the cross-bar **L**; taking care now, before extension is commenced, to give the hips the best possible position to facilitate defecation, and also to bring the counter-extending pressure as much as possible upon the tuberosities of the ischia.

It will be observed that the *essential* counter-extending pad is the one upon the side corresponding with the injured limb. The design of the other is to distribute pressure and to keep the pelvis firmly and evenly supported when the patient sits up. The strap upon the well side may be slackened, temporarily removed, or re-

placed, by the nurse, as occasion may require; but the other is not to be touched by any but surgical hands—should friends prove meddlesome, it may be protected by a small padlock.

11.—Place in the loop of plaster, transversely to the sole of the foot, a thin piece of board, two inches wide, and long enough to prevent all pressure upon the malleoli; cut a notch in the middle of each of its edges, and tie around it a strong cord by which to connect it with the swivel at the end of the wooden screw **Q**.

12.—Place transversely under the limb four or five strips of cotton cloth, three inches wide and six or seven feet long. Throw the outer end of each across the limb while you adjust the long splint **J**, the slides **H**, and the short splint **I**, and connect the extending screw with the plaster as indicated above.

13.—Take hold of the limb about the ankle and make gradual and easy extension while a competent assistant manipulates at the point of fracture, or direct an assistant to make the extension while you examine the injured part and satisfy yourself of the direction in which the displacement is most likely to occur, and the means best adapted to overcome it. At the same time you are to direct that the screw **Q** be turned, at least, till the plaster is no longer slack.

14.—By this time you should repeat the measurement of the limb, which you will of course have made at some earlier period. We can hardly say all that we desire to upon this subject without being tedious, and yet the number of those who from want of practice are incapable of making a correct comparison of the two lower extremities, as regards length, is so great that we feel justified in calling special attention thereto. The anterior superior spinous process of the ilium and the internal malleolus are the proper starting points. Observe, we do not say the movable tegumentary tissues over these regions, but you are to select fixed and corresponding points upon the opposite sides, and make these your land marks. It is also essential to a correct measurement, that the two limbs should be placed upon the same plane, equally abducted, and the same degree of eversion given to each foot. Some suppose they can judge of the length by observation, without careful measurement, but nothing can be more fallacious. Use a tape line sufficiently thin to allow you to feel through it the osseous points from which your measurements are taken. In many cases it is not well to attempt to extend the limb at once to full length, but gradually during a week or two, or even three.

15.—Throw both the ends of the strips mentioned in section 12 above, to the outer side of the limb

and adjust the inner splint, which should be more thickly padded below than above the knee, so as to avoid pressure upon the internal condyle of the femur. (This splint should be a simple straight board extending nearly from the perineum to the ankle.) Carry again the inner end of each strip to its own side. (Take notice that the ends of these strips are not designed to cross each other upon the anterior aspect of the limb.) Pass the two ends of each strip around the limb in opposite directions, outside of the splints, crossing them beneath the limb and bringing them up again upon opposite sides, tie them upon its anterior surface, or upon the anterior splint, if one be used. This will result in the following arrangement:—1st. The center of each strip will support the limb as in a sling. 2d. Passing from the center you may trace them upwards between the limb and the external and internal splints. 3d. They are reflected over these splints and pass downwards upon the outside of each—thence crossing each other beneath the limb and passing upwards again outside of all the splints to be tied on the anterior surface as directed above.

We have been particular in describing this mode of bandaging, because we deem it a point of great importance, not only to the comfort of the patient but also to the result of the case. It is not original with us—it is in use in many parts of this country. We

know not to whom belongs the honor of its introduction. In ordinary cases we have seen no other method at all comparable therewith. It has the advantage of supporting the limb at various points, and assists greatly in preserving the parallelism of the splints to each other, and also of the splints to the limb itself. We have therefore thought it worth while to illustrate it by the accompanying engraving, by which it will be seen that that which has required so many words for its description is really very simple in practice

The engraving represents a transverse section of the limb, with all its dressings.

A. The limb.

B, B, B, B. Splints.

C, C, C. The sling bandage, tied upon the anterior splint.

Lastly, Attach by means of the brass screw, the arched iron bar **N** to the outer side of the long splint. The limb is already so firmly and evenly supported that this arrangement many deem almost superfluous. It was devised for special support to the limb when we used a thick mattress at the foot of the bed, but now that we use a thin mattress upon the wooden platform **D**, it is not so necessary. We advise, however, that its use be continued, for it will enable us to raise the limb and also to move it considerably from side to side without the slightest danger of deranging the dressings or disturbing the fracture. Two or

three strips of bandage should be passed around the thigh, outside the splints, and tied firmly upon the rod **P.**

The limb should be carefully measured at each visit, and thus by continued comparison, the surgeon will be more thoroughly apprised of the real progress of the case than he could otherwise be.

Whenever it is found necessary to extend the limb, it should be done by grasping the ankle and drawing steadily in the direction of the long axis of the limb, and then the screw **Q** should be turned sufficiently to maintain the new position—in other words, the screw is designed rather as a means of keeping up, than of making extension. If there be much shortening, it should be very gradually overcome. The limb should be so elevated as to prevent all pressure of the heel upon the mattress.

What percentage of perfect results does the history of surgery show after treatment for fractures of the femur?—that is, in what proportion of cases is there neither shortening nor deformity remaining? So reliable an answer to this question can perhaps nowhere else be found, in so small a compass, as in the admirable report of Prof. Frank H. Hamilton on this subject, to the American Medical Association, published in its Transactions, Vol. X, 1857, from which we have compiled tables 1, 2, 3, 4, 5 and 6. (See Appendix.)

By reference to the report referred to, and which we should be glad to see in the hands of every surgeon, there will be found quotations from various authors, in different periods and countries, clearly setting forth the prevailing opinion that we are generally to expect a shortening of the limb. The exceptions to this rule are so few, that one surgeon of eminence in New York thinks that one inch shortening, in an average of twenty cases, is a good result, and we only give this example because it is concisely stated; others use equally strong language. Now, we have no intention of reversing the rule, and we very well understand the responsibility of promising better results than have yet been obtained; nevertheless, we think we have good reason to expect that by the use of our apparatus the percentage of perfect results will be *at least doubled*, and the average shortening reduced *at least one half*. It has thus far accomplished, more than we hoped for or promised, and we still desire to underrate rather than exaggerate its advantages. We shall from time to time report such cases as we can obtain the full record of, and leave the profession to draw their own inferences. We might quote largely from letters addressed to us, showing that surgeons in different parts of the country feel that our labor has not been in vain, but we would rather refer to all who have seen or used the apparatus, and let them speak for themselves. We make no exception, but refer to *all*, particularly to surgeons of New York and Brook-

lyn, because we regard this as the only fair course to pursue. When a man refers to individuals, he refers only to such as he *knows* will speak a good word for him; but we say, ask all who have seen or used our apparatus, and if any think ill of it, it will give them a good opportunity to say so. Some have already voluntarily laid their opinions before the public, and from these we select the following for two reasons—first, because it refers to others, and thus covers the whole ground; and, second, because we regard Dr. Hamilton as the very highest authority upon all subjects connected with fractures and dislocations. He says in a letter addressed to the editor of the *Buffalo Medical Journal and Monthly Review*, November, 1858—

"Dear Doctor: Accompanying this note you will find a couple of electrotypes, with also a complete description of them. They are intended to explain the thigh splint, or fracture bed of the Burges (J. H. Hobart Burge and Brother,) of Brooklyn, N. Y. It is the same apparatus of which Dr. Mott speaks in terms of commendation in a letter addressed to me, and which letter you will find published in the third part of my 'Report on Deformities after Fractures,' at page 317 of the tenth volume of the Transactions of the Am. Med. Association. These gentlemen having furnished me with a complete apparatus, I have, myself, had one opportunity of giving it a trial in the case of an oblique fracture of the femur in an adult laboring man. The limb has united with a shortening of not more than half an inch; and this can only be detected by a careful examination with a tape-line. He walks without any halt. This result is quite equal to any which I have ever obtained in similar cases; and I am confident that surgeons will find this apparatus a valuable addition to their means of reduction and retention in cases of broken femurs

"The apparatus is now in use at some of the New York hospitals, and has been favorably noticed by several excellent surgeons.

"It will be seen, by an inspection of the drawings, that some improvements have been made upon the apparatus since the publication of my report in the Transactions, (pp. 440–41, appendix.)

"For a more full account of the fracture bed you may consult the *New York Journal of Medicine* for May, 1857.

"The price of the improved bed and splint is $35.*

"At my request these descriptions have been furnished for your Journal; and I sincerely hope that surgeons will be soon persuaded to abandon their rickety double-inclined planes in cases of broken femurs, and substitute either this or some other form of straight splint. Considering that this is both a bed and a splint it must be regarded as cheap, and, perhaps, as the cheapest suitable apparatus which can be supplied.

"If any surgeon thinks that a shortening of half an inch in cases of oblique fracture in adults implies that their apparatus is faulty, then he will continue to employ such as his experience has proven can furnish better results; but I am very much afraid that he is deceiving himself, and that he will not discover his error until some medical friend measures the limb for him, and some court of law metes to him according to his measure.

"Very truly yours,

"FRANK H. HAMILTON.

"Austin Flint, Jr."

We now invite attention to the following cases The sources from which many of the records are

* In our great desire to bring the apparatus within the reach of all, we fixed so low a price that agents and manufacturers—much against our will—have forced us to raise it to $40.

drawn, and the well known names associated therewith, will commend them to the confidence of those surgeons to whom we are not personally known.

CASES.

Case 1.—John Madden, æt. 30 years; admitted to Bellevue Hospital, (Dr. Jas. R. Wood, Visiting Surgeon,) November 24, 1856, with simple oblique fracture of the left femur; general health pretty good, although he had been previously considerably broken down by syphilis. He could not give a very intelligible account of the manner in which the accident occurred. We first saw the patient on the 3d of December, when ether was administered by inhalation, and upon examination (the amount of tumefaction being still very great), the fracture was thought to be at, or near, the surgical neck. Subsequent examinations, however, showed it to be near the junction of the upper and middle thirds. There was considerable ecchymosis in the groin, resulting from the original injury; the limb was shortened an inch and an eighth. Assisted by Drs. Pope and Himes, resident surgeons, we applied our apparatus, and left the patient very comfortable. On visiting him the next day, we found he had removed all the dressings, but could give no reason for having done so. We then learned, for the first time, that he was familiarly known by the title of "Luny John." The dressings were replaced on Friday, December 5th, and the straps fastened by small padlocks.

The patient, continuing refractory, kept the roller and splints of coaptation continually in a disordered condition, but, owing to the nature of the apparatus, he could not disturb the fragments of the broken bone, nor by any motion of his trunk or pelvis, shorten the injured limb. The counter-extending straps first used, being insufficiently padded, caused some uneasiness at the points of pressure, but no excoriation. These were replaced by others on the 13th December. On the 3d of January, 1857, five weeks and five days from the time of the accident, the apparatus and dressings were removed. Excellent union had taken place: the limb is in perfect position, and quite as long as the other. If there be any difference, it is a line or two longer; and this we conceive to be an advantage, as the pressure upon the cartilages (consequent upon using the limb which has been so long extended), and also the absorption and contraction of the callus during the process of complete ossification, must necessarily shorten the limb a little during the few months immediately succeeding the treatment. In this case, the arched form of the femur is perfectly preserved. We are confident that any one acquainted with the man would say that no apparatus could be subjected to a severer test, or yield a better result.

Case 2.—James Kloye, æt. 13 years, of good health and constitution; admitted to Bellevue Hospital, (Dr. Jas. R. Wood, Visiting Surgeon,) January 9, 1857, with simple oblique fracture of right femur, at about the

junction of the middle and lower thirds, caused by being run over by a carriage. Assisted by Dr. Himes, resident surgeon, we applied our apparatus January 15—six days after the accident—the inflammation and swelling having in a great measure subsided. The limb was shortened an inch and a half. We gradually extended it to full length. The patient was perfectly comfortable during the whole course of treatment. The dressings were twice renewed, and finally removed five weeks and four days after the accident. Union firm; position of foot natural; no perceptible shortening, except upon careful measurement, when a difference of half an inch may be detected. The adhesive plaster used in this case did not retain its place well; yet we have no reason to complain of the result.

Case 3.—Michael Connal, æt. 30 years, laborer; admitted to Bellevue Hospital (Dr. Jas. R. Wood, Visiting Surgeon,) March 5, 1857, with simple oblique fracture of right femur, near the middle of the shaft, and also with simple fracture of left tibia. These injuries were produced by the falling of a bank of earth. Dr. Himes, resident surgeon, applied our apparatus four days after the accident, and also a starch bandage to the fractured leg, as soon as the swelling had sufficiently subsided. Before dressing, the right limb was an inch and a half shorter than the left, as nearly as could be determined, the points of measurement being less absolute when both limbs are frac-

tured. This would have been an annoying case under any ordinary method of cure, owing to the difficulty of relieving the bowels without disturbing either limb. As it was, there was not a more comfortable patient in the wards, nor one more easily taken care of. Firm union was the result in both limbs, and if there was any shortening, that of one limb exactly compensated for that of the other, as they remained of equal length.

Case 4.—Daughter of Rev. Dr. ——; aged 9 years; of very feeble constitution. Had sustained several fractures previously. Has congenital malformation of both legs, giving the appearance of an anchylosed knee about four inches below the natural joint, and presenting an angle of 60° with the vertex in front.

Nov. 7th, 1857.—Fell heavily upon the floor while running, and fractured the left femur just above the middle. I was called to this case by my friend Dr. Mulhallon, of this city. Crepitus distinct; considerable displacement. I placed the limb over a pillow, and directed evaporating lotion. On the third day applied our apparatus. Owing to the deformity, the adhesive plaster could only extend from the point of fracture to the angle above mentioned; yet it worked well, and the result was, after six weeks, perfect union and a better parallelism between the two limbs than had before existed. Of course no inference could be drawn from this case, in reference to the effect of treatment upon the length of the limb, the other thigh having been before fractured. Yet this case is

valuable as showing the applicability of the apparatus to cases in young children—particularly in connection with the fact, that she was allowed to exercise all the freedom of motion of which she was capable—the only precaution being to present her playthings to her as often from one side of the bed as the other, to prevent any continued inclination of the pelvis to the right or left. The limbs are now of equal length.

Case 5.—Chief Justice ——, 76 years of age; treated by Dr. HOFFMAN, a surgeon of eminence in the city of New York. This case is one of interest from every point of view; but especially, as literary old gentlemen, of nervous temperament, are always hard subjects for any sort of restraint.

The fracture was of the right femur, somewhat above the junction of the middle and upper thirds, was very oblique, and the fragments much displaced. The injury was caused by slipping down a flight of stone steps; the limb was much contused, and shortened two inches and a half. Our apparatus was applied on the 9th day. The swelling was still great, and ecchymosis extensive. The limb was gradually brought down as nearly to its normal length as seemed compatible with comfort and safety. The dressings were readjusted two or three times in the course of treatment, and upon examination, (seven weeks and two days from the accident,) it was found firm union had taken place with shortening of only one inch, and no deformity. The judge was as comfortable during the whole course of treatment

as one in his feeble state could possibly be ; and when removed from the apparatus to an ordinary bed, he found the change so unpleasant that his surgeon had him replaced upon the fracture bed at his own request. Various causes, not essential to this report, combined to prevent the patient's walking for several weeks after the bone united. He finally moved about and used his limbs very well.

Case 6.—Fracture within the capsular ligament. Patient about 50 years of age ; suffering at the same time with a fracture of the radius and ulna, and also, during his confinement had an attack of pneumonia. This case was treated at the Troy hospital. Dr. C. L. Hubbell, attending surgeon, says: "I did not expect to get union, but thought, nevertheless, I would try the new apparatus. No union took place, but the patient is able to walk about with one cane, and his locomotion is as good or better than that of any one I have ever seen who sustained that fracture. I think the chances of getting union in these fractures would be much greater with the use of your apparatus than with any other, on account of the advantage gained by giving firm and comfortable support to the femur at its middle by the suspensory arrangement; thus avoiding the dragging downwards and backwards of the limb, which must necessarily take place without it, although extension in any form were adopted at the same time."

Again, he says: "We shall be glad to make use of your apparatus whenever opportunity offers, and recommend it to all who treat fracture of the thigh or pelvis."

Case 7.—Of this case I have not a full record. It was treated in the hospital at Buffalo. It is the same which is referred to in Dr. Frank H. Hamilton's letter on page twenty-six. The essential points are as follows: Patient an adult laboring man; fracture simple and oblique. Result, firm union; shortening half an inch; only to be detected by careful measurement. There is no deformity, and patient walks without any halt.

Case 8.—Miss ——, aged 40, of feeble constitution, had curvature of the spine when a young girl. In February, 1858, made a misstep and fell from a chair upon a stone hearth, fracturing the left femur obliquely at the junction of the upper and middle thirds. Dr. Harcourt of Staten Island, took charge of the case, and called me to see it with him. We applied our apparatus on the fifth day. The patient prophesied that it would be a "long case," if it ever got well, for she judged from the experience of the family—her brother having sustained a fracture of one leg in the early part of the previous year, and getting firm union only after seven or eight months. Before the apparatus was applied, the limb was two inches shortened. It was gradually extended to full length, and retaining perfectly the normal position, was not re-dressed till six weeks had elapsed, during which time she continued very comfortable. Upon examination, the union

was found to be only ligamentous. Apparatus re-applied. Limb examined from time to time. Union becoming more and more firm till the fourteenth week. when, supposing we had effected all we could by extension, we removed the patient to an ordinary bed, and applied a splint made of pasteboard. After one week it was found the limb had retracted an inch, and the patient finding her new quarters by no means as comfortable or convenient as the old, she was replaced upon the fracture bed, where she remained several weeks, sitting up daily. Her health has never been good. Has suffered considerably from costiveness, leucorrhœa, and menorrhagia. In August, 1858, we included this case in a series reported to the *New York Journal of Medicine*, for the next month, and expressed considerable doubt as to the future usefulness of the limb. We are gratified now to be able to state, that the union became perfectly firm. There was false anchylosis of the knee, which, however, yielded to passive motion, and gradually the patient gained power over the limb until motion became good. There is no bowing at the point of fracture, and although the limb is shortened three-fourths of an inch, it is hardly perceptible in the gait.

Case 9.—Miss ——, aged 13. Nervous and sensitive in a marked degree. While at play fell over the balustrade, a distance of twenty-five feet, striking upon a hall table, and then upon the floor. She was taken up insensible, and continued so for many hours. When

the effects of the concussion passed away, the only fracture was found to be at the cervix femoris of the left side. Dr. Willard Parker, of New York, took charge of the case. He used the straight splint (Physick's Desault.) The counter-extending pad, though used with all the caution and judgment for which Prof. Parker is so justly celebrated, was badly borne; causing excoriation and pain. Somewhat more than three months elapsed, and no union took place; whereupon he recommended a trial of our apparatus, and being himself much engaged elsewhere, requested one of us to take charge of the case. We did so; Dr. P. making an occasional visit to observe its progress. Our apparatus was first applied on the 11th of March, thirteen weeks after the accident. During the seven weeks next succeeding, the patient was perfectly comfortable, except that she complained slightly of the counter-extending pressure upon the perineum, which was rendered morbidly sensitive by the previous pressure. This prevented so great extension as we should otherwise have made, and at the end of the period mentioned it was found that perfect union had taken place, with a shortening of about an inch and a half. There is anchylosis of the hip, and also of the knee. She walks without crutch or cane, and the limb is in the best possible position for locomotion under such circumstances.

The next case was treated at the new York Hospital, under the care of Dr. John Watson, attending surgeon,

and Drs. Ray and Baylis, house surgeons. There is, perhaps, no institution in the world where fractures are better treated than in this hospital. The following history is taken from the record:

Case 10.—"Andrew Badecker; aged 45; Germany; carman; admitted January 12, 1858. (Dr. Watson.)

"Patient was loading his cart, when the horse suddenly wheeled round and backed, crowding his right thigh between the tail-board of the cart and an upright wooden pillar, causing a simple and nearly transverse fracture, by direct violence, just above the condyles. Moderate contusion; crepitus distinct; shortening, one inch and a half

"*Treatment.*—Decubitis; limb on double inclined plane.

"13th.—Slight swelling of knee joint. No tenderness.

"16th.—Shortening two inches.

"16th.—Put up this morning in Burge's apparatus.

"25th.—Apparatus re-adjusted.

"Feb. 22d.—Thigh examined. Union firm; no deformity; no shortening. Patient can raise the limb from the bed. Apparatus re-applied. Patient has sat up in bed while eating, every day since the first three days.

"March 1st.—Apparatus removed; limb examined. No shortening; firm union.

"March 17th.—Discharged cured."

Case 11.—Was treated in the same ward as the preceding, under the care of the same house surgeons, while Dr. Halsted was attending surgeon. The following is the hospital record:

"William Smith; aged 30; Ireland; laborer. Admitted March 5, 1858. (Dr. Halsted.) One hour ago, while patient was loading a cart, a keg of white lead, of two hundred weight, rolled of the truck and over his right leg and thigh, causing an oblique fracture of the latter, at junction of middle and lower thirds, the

lower fragment projecting inwards. Crepitus and false point of motion. Shortening one inch and a quarter. Not much contusion. General health good.

"*Treatment.*—Placed limb on double inclined plane.

"7th.—Increased swelling. Considerable effusion into the knee joint. Ordered infus. sennæ, comp. ʒiv., which operated freely. Ordered lotio. evap.

"8th.—Swelling and effusion increased.

"13th.—Ordered straight apparatus. Shortening one inch and a quarter.

"15th.—Fluctuation and swelling in knee joint increased; has occasional stabbing pain in it. Tenderness on either side of the lig. patellæ.

"23d.—Limb examined to-day. Little or no union; shortening one inch and a half. Limb placed in Burge's apparatus, and brought down to normal length. Still some fluctuation in the joint.

"April 5th.—Position good.

"14th.—Apparatus re-adjusted; fair amount of union; no deformity; shortening three-eighths.

"May 1st.—Apparatus removed; firm union; no deformity; no shortening. Slight stiffness of the knee joint; is barely able to raise the heel from the bed. Ordered coaptation splints and bandages to the limb.

"8th.—Raises and moves the limb with ease." Subsequently discharged cured.

Case 12.—Also at the New York Hospital, in the first surgical division, under the care of Dr. Shrady. (Dr. Halsted, attending surgeon.)

"Alexander McCrodden, aged 24; Ireland; laborer. Admitted April 19th, 1858. Shortly before admission, while attempting to raise a large piece of flagging, along with some others it slipped from his grasp and struck him with the other edge, just above the knee, causing a fracture at the junction of lower and middle thirds of the femur. It is very oblique in its character. There was some suspicion of fracture through the condyles, but this was not made out. Considerable swelling; shortening, one inch and a half.

"*Treatment.*—Limb placed on double inclined plane, and evap. lotion employed.

"26th.—Had to-day an attack of hemoptysis. Has had cough for some time. On percussion marked dullness was detected under left clavicle; local crepitant *rale;* vocal resonance marked; general condition good; appetite good; sleeps well, etc.

"May 6th.—BURGE's apparatus applied. Shortening, three-fourths of an inch (after extension).

"June 5th.—Apparatus taken down and re-adjusted; union quite firm; can lift his leg with ease; no shortening whatever.

"June 11th.—Apparatus removed; no shortening; can elevate and rotate the limb with ease. Limb placed on double inclined plane.

"20th.—Up and about on crutches.

"29th.—Discharged cured."

Case 13.—I will report this case in the words of E. KRACKOWIZER, M. D., of New York, who was the attending surgeon:

"WILLIAM STRAUSS, of 593 Fourth street, New York; between 8 and 9 years old; fell, September 18th, 1857, from a distance of about eight feet, and besides other slight bruises, sustained a simple fracture of the right thigh in its middle. I put him, September 22d, in your apparatus, which answered my expectations in every particular. I never felt so free from anxiety about a good result, in treating a fracture of the thigh, as in this case. The dressing was renewed once on the 13th of October. The apparatus was removed entirely October 27th. The union was firm; the fracture had united without the least shortening. The shape of the limb a couple of months afterwards was as perfect as that of the uninjured limb."

Case 14.—The following case was treated in the United States Marine Hospital, Detroit, Michigan, by Z. PITCHER, M. D., Ex. President of American Medical

Association, who kindly communicated it to me. I will give it in his words:

"The patient was an adult, and otherwise in good health. The injury was caused by the fall of a steamboat fender across the thigh two inches above the condyles of the femur, by which the bone was not simply fractured but crushed. He was put into the apparatus on the 26th of July, and was released from it on the 5th of Sept., 1858, during which time he scarcely made a complaint that could be attributed to the apparatus itself. The fractured limb will not be over one-fourth of an inch shortened, and the motion of the knee joint is now (Sept. 16th) nearly one half its normal extent."

In commenting upon this case, the doctor says:

"I have been much pleased with the working of the apparatus, particularly with the action of the counter-extending straps, and the means of preserving the curve of the femur during extension."

After a kindly suggestion in reference to adding a foot-piece by which, in his opinion, the value of the instrument would be increased, he says:

"A little modification would make it the best apparatus extant for the treatment of Morbus Coxalgia."

The next case being one of unusual interest, I need make no apology for detailing it at some length. The fracture was at the cervix, and united firmly with loss of the cervix. The patient dying some weeks after of phthisis—the specimen was secured by Dr. James R. Wood, (who had charge of the case,) and presented to the New York Pathological Society, Jan. 27th, 1858, with appropriate remarks, after which he gave the following history of the case:

Case 15.—"The subject from whom this specimen was taken was 57 years of age at the time of the acci-

dent, May 20th, 1857, and although not very robust, still enjoyed good health. He was not strictly temperate, neither could he be considered intemperate, judging from the history he gave me of his habits. When a young man, he contracted a chancre, which was treated as soon as it was noticed, and was not followed by any discoverable constitutional symptoms that I could ascertain. He came under my charge May 23d, nearly three days after the accident of which he gave me the following account: While descending a stairway he slipped a few feet and fell, striking the post lateral portion of the left trochanter major against the edge of one of the steps. On recovering himself he found he could not move the left lower extremity, but supposing at the time that he had suffered no serious injury, he did not seek surgical advice, as he thought he should recover in a few days and be able to resume his trade, which was shoe-making. Finding, however, that he grew no better, he came under my charge, presenting the following symptoms.—Shortening of the left lower extremity, a little over one inch; eversion of the foot; inability to elevate or rotate the limb inwards, and very well marked osseous crepitus when extension and rotation were made. He was examined by a number of medical gentlemen, who were all of the opinion that a fracture of the neck of the bone existed, but differed from me in not expressing an opinion as to its seat. Taking into consideration the age of the patient and the small segment of a circle described by the trochantar major when extension and rotation were made, I supposed it to be a fracture of the neck within the capsule. The only treatment adopted for the first three days was to place the limb in as easy a position as possible. On the 20th of May a long strip of adhesive plaster was applied along the inner and outer aspects of the leg and thigh, forming a loop a couple of inches long below the foot. The limb was then snugly bandaged and secured to a splint that extended from a body-belt to a point eight or ten inches beyond the foot. Extension was then

made by connecting the screw in the lower end of the splint, to the loop of adhesive plaster, and the counter-extension made by a perineal pad that was attached to the upper end of the same splint. The extension was increased from day to day, keeping the limb at nearly its normal length, until the fourth day, when the perineal pad, although soft, had chafed him so much that it had to be removed. He was then placed in an apparatus invented by Dr. Burge, with which counter-extension is made over the tuberosities of the ischia, and extension by means of the screw at the lower part of the long splint. In this apparatus, his pelvis was held secure and at rest by being confined by the splint on one side and a movable support on the other. On June 24th, it was found necessary to re-dress the limb, as the bandages had loosened over the leg and the plaster began to slip. At this time there was half an inch shortening, by measurement. He bore this treatment very well. No change was made from this time till July 19th, when the apparatus was dispensed with. The limb still continued half an inch shorter than the uninjured one, and judging from the examination made at the time, union was supposed to have taken place. Having complained of considerable pain in the joint when moved or left unsupported by a pad behind the trochanter major, a blister was applied with the supposition that some inflammation existed within the capsule. This was followed by relief for some days, after which it was considered proper to repeat it, and so on at intervals for some weeks; at the end of which time he could forcibly push himself up in bed by placing the foot of the injured limb against the foot-board of the bedstead. He never recovered, however, so as to walk about, although he would stand on the limb whenever he was desired to do so. On the 19th of August he was attacked with acute bronchitis, which soon yielded to treatment. As some cough and expectoration continued, a thorough examination of his chest was made, and it was found that tubercles

were softening in the anterior portion of the lungs. With but few exceptions he was confined to his bed till the time of his death, January 23d, 1858.

"*Autopsy.*—Twenty-three hours after death: Lungs found extensively diseased. The present specimen was then removed. The neck of the bone is entirely gone, the head being firmly united to the trochanter major."

This specimen has been placed in the museum of Bellevue hospital to throw what light it may upon the vexed question, "Do intra-capsular fractures ever unite by bone?" I have examined it carefully, and must admit that I do not consider its testimony clear upon this point. Like all specimens which I have ever seen of the sort, it leaves room to suspect that the fracture was both within and without the capsule.

Case 16.—Was treated at Bellevue hospital (Dr. Jas. R. Wood, Visiting Surgeon, Dr. Chas. Phelps, House Surgeon.) Dr. Bab, Assistant Surgeon, kindly transcribed for me the following record:

"Celia Farmer; Irish; married; is not sure of her age; calls herself 60—is apparently 70 or more—of good constitution, and moderately temperate habits. Admitted to the hospital December 28th, 1858. On Christmas-eve fell from a ladder a distance of about eight feet, striking the outer side of the left thigh across the edge of a large iron kettle. Upon examination there was found to be great pain and much ecchymosis at the seat of injury, particularly on the outside of the limb—limb shortened two inches, and a fracture easily discovered just above the condyles. It was slightly oblique downwards and forwards—the upper fragment overlapping the lower anteriorly.

"*Treatment.*—At first, limb merely placed in a comfortable position.

"Jan. 3d.—Limb still two inches short; BURGE's apparatus applied with splints of coaptation and adhesive plaster extension. Whisky given daily. On account of the age and infirmity of the patient, it was not deemed advisable to make very forcible extension.

"March 1st.—Apparatus removed; union firm; no deformity; no apparent shortening except by careful measurement, and then not more than three-eighths of an inch. Has been very comfortable during whole course of treatment; sitting up daily.

"April 1st.—Walks without a staff."

Case 17.—Treated at New York hospital, (Dr. PARKER, Visiting Surgeon, Dr. SHRADY, House Surgeon.) We copy, by permission, from the hospital minutes:

"WM. CARROLL, æt. 16; Irish, confectioner; admitted July 22d, 1858. At six, P. M., patient—a strong healthy person—while walking with a companion, was tripped up by the latter who fell with his entire weight across his lower right limb. On admission, there is found to be fracture of his right thigh just above its middle. No crepitation distinguished, but free mobility at seat of injury. Shortening one inch.

"*Treatment.*—Ordered decubitus; limb placed on double inclined plane.

"Aug. 2d.—Limb put up in long splint.

"Aug. 6th.—Shortening little less than one inch.

"Aug. 12th.—A slough has made its appearance in the perineum, but is comparatively superficial; it is oblong in shape and covers an area of about two square inches. The counter-extending band loosened. Up to this time the leg was down to its full length.

"17th.—Slough gradually clearing off. Shortening now about five-eighths of an inch.

"Aug. 21st.—Some mobility at point of fracture. Shortening half an inch. Limb put up in BURGE's apparatus. Slough in perineum has all cleared off, and the ulcer is granulating.

"Sept. 15th.—Apparatus removed to-day. Extension has been kept up in such a way that there is *no* shortening; no deformity; union perfectly firm. Limb placed on double inclined plane.

"Oct. 5th.—Gets about the ward on crutches." Subsequently discharged cured.

The reader will not fail to observe that this makes four *consecutive* cases treated on our apparatus in New York hospital, (by different surgeons,) in which the record shows *no shortening* and *no deformity*. So rare, indeed, have been these *perfect results* in the history of surgery, that many excellent surgeons have supposed them impossible, and doubtless some will now suspect that these were cases *selected* in order to make a *good report*. We invite special attention to the circumstances of each case and to the names of those under whose surveillance they were treated.

We have other cases in progress, which will soon appear.

It has often been remarked that conservatism is carried to such an extreme by the members of our profession, that anything new is sure to be violently opposed if not rejected. We are happy to bear witness that no such spirit has been manifested towards our humble effort, and that, except in one or two rare instances, we have received the most cordial congratulations of our professional brethren.

APPENDIX.

As we design the cases detailed in this pamphlet for future reference and comparison, we have arranged them in tabular form on pages viii. and ix., appendix, where we have presented their principal points in contrast with those of cases treated by other methods, as seen in the six following tables compiled from Prof. Frank H. Hamilton's report to the American Medical Association, Vol. X, 1857. These calculations are based upon too few cases to be regarded by us as an *exact* estimate of the percentage of perfect results, or of the average amount of shortening which will uniformly occur. The figures are only approximative. It will be seen that we have constantly rejected small fractions in favor of other methods and against our own. In a future edition of this pamphlet, we intend to renew these comparisons with a sufficient number of case to demonstrate every position we have taken.

TABLE 1.

Compiled from Hamilton's "Report on Deformities after Fractures." (Transactions of the American Medical Association, Vol. X, 1857.) Including 105 cases of fracture of the femur, treated upon different plans.

WHOLE NUMBER:	AGE OF PATIENTS:	RESULT:
105	1 to 84.	Died, . . . 3
		Unknown, . . 1
	AVERAGE AGE:	Refractured, . 5
	28 years.	Shortened, . 87
		Not Shortened, 9

AVERAGE SHORTENING, in eighty-seven cases, ONE INCH.

PERCENTAGE OF PERFECT RESULT, in ninety-six cases, (rejecting the nine marked "died. unknown and refractured,") about NINE AND A HALF.

AVERAGE AGE, in cases in which no shortening remained, SEVEN AND A QUARTER YEARS.

TABLE 2.

Compiled from Hamilton's "Report on Deformities after Fractures." (Transactions of the American Medical Association, Vol. X, 1857.)—including 39 cases of fracture of the femur, in its upper third.

WHOLE NUMBER:	AGE OF PATIENTS:	RESULT:
39	1 to 84. AVERAGE AGE: 44 years.	Died . . . 3 Shortened, . 35 Not Shortened, 1 (Refractured, 3)

AVERAGE SHORTENING, in thirty-two cases, (rejecting the six marked "died" and "refractured,") ONE INCH.

PERCENTAGE OF PERFECT RESULTS, in thirty-two cases, THREE AND ONE EIGHTH.

AGE OF THE PATIENT, in whose case no shortening remained, ONE YEAR.

TABLE 3.

Compiled from Hamilton's "Report on Deformities after Fractures." (Transactions of the American Medical Association, Vol. X, 1857.) Including 21 cases of fracture of the cervix femoris, treated upon different plans.

WHOLE NUMBER:	AGE OF PATIENTS:		RESULT:
	31 to 84.	Within the capsule, . . . 4	
		Probably within, . . . 2	Died, . . . 1
21		Without the capsule, . . 4	Shortened, . 20
	AVERAGE AGE:	Probably without, . . . 2	Not Shortened, 0
	60 years.	Absolutely uncertain, . . 9	

AVERAGE SHORTENING, ... ONE INCH AND ONE TWELFTH.

PERCENTAGE OF PERFECT RESULTS, ... 0

TABLE 4.

Compiled from Hamilton's "Report on Deformities after Fractures." (Transactions of the American Medical Association, Vol. X, 1857.) *Including* 17 *cases of fracture of the femur in the upper third, below the trochanter major.*

WHOLE NUMBER:	AGE OF PATIENTS:	RESULT.
17	1 to 55.	Died, . . . 1 Shortened, . 15 Not Shortened, 1 (Refractured, 3)
	AVERAGE AGE: 26 years.	

AVERAGE SHORTENING in twelve cases, (rejecting the four marked "died" and "refractured") THREE QUARTERS OF AN INCH.

AVERAGE SHORTENING, of those marked "refractured," ONE INCH AND THREE QUARTERS.

PERCENTAGE OF PERFECT RESULTS, in thirteen cases SEVEN AND THREE QUARTERS.

AGE OF PATIENT, in whose case no shortening remained, ONE YEAR.

TABLE 5.

Compiled from Hamilton's "Report on Deformities after Fractures." (Transactions of the American Medical Association, Vol. X, 1857.) Including 47 cases of fracture of the femur in its middle third, treated upon different plans.

WHOLE NUMBER:	AGE OF PATIENTS:	RESULT:
47	1 to 40. AVERAGE AGE: 17 years.	Shortened, . . 41 Not Shortened, . 6 Amount of shortening, unknown in five cases.

AVERAGE SHORTENING, in thirty-six cases, (rejecting five marked "unknown") EIGHT NINTHS OF AN INCH.

PERCENTAGE OF PERFECT RESULTS, in forty-seven cases, about THIRTEEN.

AVERAGE AGE, in cases in which no shortening remained, only EIGHT AND ONE THIRD YEARS.

TABLE 6.

Compiled from Hamilton's "Report on Deformities after Fractures." (Transactions of the American Medical Association, Vol. X, 1857.) Including 19 cases of fracture of the femur in its lower third, treated upon different plans.

WHOLE NUMBER:	AGE OF PATIENTS:	RESULT:
19	3 to 42. AVERAGE AGE: 20 1-3 years.	Shortened, . . 17 Not Shortened, . 2 (Refractured, . 1) Amount of shortening, in one case unknown.

AVERAGE SHORTENING, in fourteen cases (rejecting those marked "refractured" and "unkown," and also one case in which their was exfoliation,) SIX SEVENTHS OF AN INCH.

PERCENTAGE OF PERFECT RESULTS, TWELVE.

AVERAGE AGE, in cases where no shortening remained, only FIVE AND A HALF YEARS.

TABLE 7.

Including 17 *cases treated in Burge's apparatus.*

WHOLE NUMBER:	AGE:	REGION:	RESULT:
17	9 to 76	Upper 3d. 6.	Shortened, . . . 9
		(Cervix, 3.)	Not Shortened, . 8
	AVERAGE AGE:	Middle 3d. 8.	Lig. Union, (Intra-Capsular.) 1
	33 1-2.	Lower 3d. 3.	

PERCENTAGE OF PERFECT RESULTS, including all cases, simple, complicated, comminuted and intra-capsular, FORTY-THREE AND A HALF.

PERCENTAGE OF PERFECT RESULTS, rejecting cases 3 and 4 (in which both limbs were involved) FORTY.

AVERAGE SHORTENING, in the whole number treated, ONE THIRD OF AN INCH.

AVERAGE SHORTENING, in cases shortened, ELEVEN SIXTEENTHS OF AN INCH.

AVERAGE AGE IN PERFECT CASES, (rejecting cases 3 and 4) TWENTY-FIVE AND A HALF.

TABLE 8

Resume of cases treated in Burge's Apparatus.

No.	Age.	Sex.	Limb.	Region.	Character.	Result.
1	30	M.	L.	Upper 3d.	Simp. O.	Perfect.
2	13	M.	R.	Middle.	S. O.	1-2 in. short.
3	30	M.	R.	Middle.	Compl.	Perfect.*
4	9	F.	L.	Middle.	S. O.	Perfect.†
5	76	M.	R.	Upper 3d.	S. O.	1 in. short.
6	50	M.	——	Cervix.	Intra Cap.	Lig. union.‡
7	30?	M.	——	Shaft.	S. O.	1-2 in. short.
8	40	F.	L.	Upper 3d.	S. O.	3-4 in. short.
9	13	F.	L.	Cervix.	Compl.	1 1-2 in. short.
10	45	M.	R.	Lower 3d.	S. T.	Perfect.
11	30	M.	R.	Middle.	S. O.	Perfect.
12	24	M.	——	Middle	S. O.	Perfect.
13	9	M.	R.	Middle.	S.	Perfect.
14	30	M.	——	Lower 3d.	S. Commtd.	1-4 in. short.
15	57	M.	L.	Cervix.	Intra Cap.	1-2 in. short.
16	70	F.	L.	Lower 3d.	S. O.	3-8 in. short.
17	16	M	R.	Middle.	S. O.	Perfect.

* Complicated with fracture of opposite Tibia.—Result, limbs of equal length.

† In this case there was congenital malformation of both limbs, and the opposite thigh had been previously broken.—Result, limbs of equal length.

‡ Walks with one cane—locomotion good.

In cases of fractured femur, age is an important consideration; we may, therefore, *cæteris paribus*, expect better results among children than adults. So certain is this rule, that in the 105 cases included in "Hamilton's Report," to which reference has been made, all the patients who sustained no shortening of the limb were under 16 years of age. They were respectively, 1, 9, 13, 9, 3, 15, 3, 8 and 3, making an average of only 7 1-9 years. On the other hand, with one exception, all of our patients, whose cases resulted in no shortening and no deformity, were *over* 15—their ages being respectively 16, 24, 30, 30 and 45 years, and making an average (with the exceptional case which was 9 years old) of 25 1-2 years.

Again, according to the most liberal estimate—rejecting from the calculation such cases as must of necessity be excluded from all hope of a good result—it is generally conceded that there was never known, in any considerable number of cases, more than *ten* per cent of full length limbs after treatment. Now, contrast with this our report of *forty* per cent. (at the lowest estimate) and a liberal allowance may be made for the possibility that future cases may not quite reach the same point of excellence.

A fracture of this longest bone in the human body is an accident sufficiently grave to demand of the attending surgeon that he should avail himself of the best possible appliances which have ever been devised; and we submit to the judgment of the reader whether

our apparatus should not be at once universally adopted because of the vastly greater comfort afforded the patient, even if this were the only consideration,—provided, of course, that the results afforded by it were equal to those before obtained. We desire that this apparatus should stand or fall by its own merits—our appeal is to the members of a liberal and high-minded profession, who have the lives and limbs of community in charge. We therefore bespeak the careful examination and criticism which the importance of the subject presented seems to demand.

The price of this apparatus is Forty Dollars, including the mattresses, and a nice case for its preservation when not in use. It should be remembered in this connexion, that it is adapted to fractures of either limb, and to patients of any size, so that a surgeon once provided is provided for all time—no portion of the apparatus requiring to be renewed except the central cushion, and counter-extending pads, which is but the work of an hour. We have never yet seen a man who did not consider an inch of his thigh bone worth more than the price of this apparatus; or one who would be willing, for so small a consideration, to submit during six weeks to the painful confinement hitherto required in the treatment of fractured femur. Shall we, can we, as surgeons, place less value upon the comfort of our patients or the integrity of their limbs?

OBSERVATIONS

ON

THE TREATMENT

OF

FRACTURES OF THE FEMUR

WITH A NEW APPARATUS

AND

REPORT OF SEVENTEEN CASES.

BY

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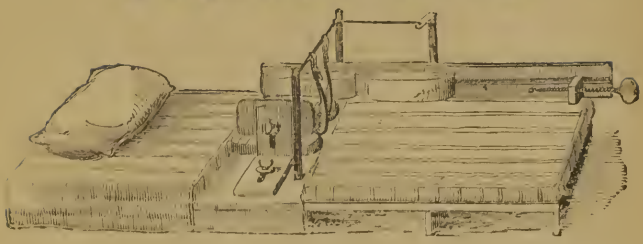

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